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EXAMINER

RUDE, TIMOTHY L

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 08/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/822,575

Applicant(s)

NAGASAKO, NAOKI

Examiner

Timothy L Rude

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 26 June 2003. These drawings are accepted by the Examiner.

Claims

2. Claims 1 and 3-6 are amended.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagerwall et al (Lagerwall) USPAT 6,184,967 B1 in view of De Koning USPAT 6,377,327 B1.

As to claim 1, Lagerwall discloses in Figures 5 and 3A a liquid crystal display apparatus comprising: a liquid crystal panel having a pair of substrates, 1 and 2, facing each other; and liquid crystal material (col. 9, lines 9-12) sealed between said pair of

substrates, said pair of substrates being sealed at a first seal portion, 4, which is located at peripheral portion of said substrates and also being sealed at a linear-shaped spacer, 12, (Applicant's second seal portion) located outside of an effective picture element area separated from the peripheral portion and further wherein a supporting height of the first seal portion and the second seal portion is substantially the same, and the seal portions are adhered to the opposite substrate with a binder or any other type of joint (col. 11, lines 23-25 and col. 12, lines 22-25).

FIG.5

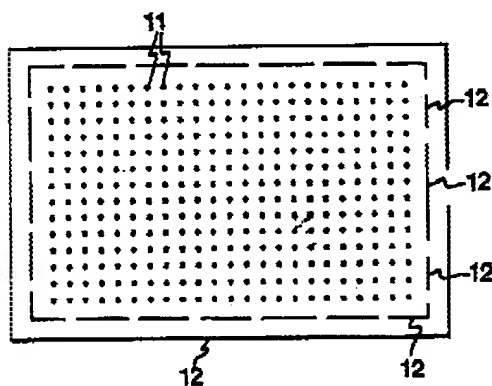
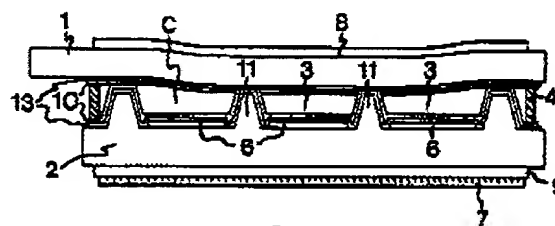


FIG.3A



Lagerwall does not explicitly disclose that the first seal portion and the second seal portion are substantially comprised of the same seal material.

De Koning teaches in Figure 1, sealing edges, 7 and 8, (Applicant's first and second seal portions, respectively) comprised of photosensitive resin with embedded spacers (Applicant's same seal material) which are simultaneously patterned photolithographically (col. 4, lines 27-36) to provide a constant distance between the substrates throughout the surface area of the optical element (col. 3, lines 50-65) to thereby avoid unwanted lens actions and smear (col. 1, lines 22-40) with reduced

dependence upon other spacers (col. 1, line 61 through col. 2, line 7 and col. 3, lines 55-65).

De Koning is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use first and second seal portions comprised of substantially the same seal material to provide a constant distance between the substrates throughout the surface area of the optical element to thereby avoid unwanted lens actions and smear with reduced dependence upon other spacers.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Lagerwall with the first and second seal portions comprised of substantially the same seal material of De Koning to provide a constant distance between the substrates throughout the surface area of the optical element to thereby avoid unwanted lens actions and smear with reduced dependence upon other spacers.

As to claim 4, the manufacturing method of a liquid crystal display apparatus having a liquid crystal display panel, comprising the steps of: superimposing a pair of facing substrates to form said liquid crystal display panel; and injecting liquid crystal display material between said pair of facing substrates, wherein a first portion of seal material is coated on periphery of said pair substrates, and a second portion of seal material is coated in at portions located outside of an effective picture element area of said liquid crystal display panel and further wherein a supporting height of the first and second portions of seal material is substantially the same, the first portion of seal

material and the second portion of seal material being substantially comprised of the same seal material, would have been obvious given the structure of rejected claim 1.

4. Claims 2, 3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagerwall and De Koning, as applied to claims 1 and 4 above, in view of Applicant's admitted prior art (APA).

As to claims 2 and 3, Lagerwall in view of De Koning teaches the apparatus above.

Lagerwall in view of De Koning does not explicitly disclose an LCD apparatus wherein said liquid crystal panel is a micro-lens type liquid crystal display panel having an injection gate for liquid crystal material, a TFT substrate, a micro-lens equipped facing substrate, and on-chip spacers, there-between.

APA discloses in Figures 2-5 an LCD apparatus wherein said liquid crystal panel is a micro-lens type liquid crystal display panel having an injection gate, 9, for liquid crystal material, a TFT substrate, 2, a micro-lens, 3, equipped facing substrate, 4, and on-chip spacers, 6, there-between.

Lagerwall teaches dot-shaped spacers, 11, (Applicant's said second seal portion includes said dot-shaped seal portions) near corners of said effective picture element area (four corners in figure 5) and further includes linear-shaped spacers, 12, (Applicant's linear-shaped second seal portions/part(s)) located and extending along an

edge of an effective picture element area on all four sides (Applicant's opposite to an injection gate for liquid crystal material). De Koning also teaches dot-shaped spacers, 10, in Figure 3.

Lagerwall teaches the motivations for adding linear-shaped spacers, 12, (Applicant's second seal portions) located outside of an effective picture element area and adhered to the opposite substrate with a binder or any other type of joint (col. 11, lines 23-25 and col. 12, lines 22-25), including improved flow during LC fill, avoiding LC alignment defects, and preventing void formation in the active part of the display at low temperatures (col. 10, lines 30-40), and to produce a rigid display (col. 11, lines 18-25).

Lagerwall is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add dot-shaped and linear-shaped spacer/seal portions to prevent void formation in the active part of the display at low temperatures.

De Koning is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use first and second seal portions comprised of substantially the same seal material to provide a constant distance between the substrates throughout the surface area of the optical element to thereby avoid unwanted lens actions and smear with reduced dependence upon other spacers.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to combine the LCD of APA with the dot-shaped and linear-shaped spacer/seal portions of Lagerwall, to prevent void formation in the active part of the display at low temperatures, that are made of substantially the same seal material of De Koning to provide a constant distance

between the substrates throughout the surface area of the optical element to thereby avoid unwanted lens actions and smear with reduced dependence upon other spacers.

As to claim 5, the manufacturing method of a liquid crystal display apparatus as cited in Claim 4, wherein said pair of substrates are a TFT substrate and a micro-lens equipped facing substrate, and said pair of substrates are superimposed and sealed after forming on-chip spacers there-between would have been obvious given the structure of rejected claim 2 above.

As to claim 6, the manufacturing method of a liquid crystal display apparatus as cited in Claim 4 or Claim 5, wherein said second seal material is coated in dot-shaped form near corners of said effective picture element area and an injection gate for liquid crystal material and the seal material is coated in linear-shaped form extending along an edge of the effective picture element area at a portion located opposite to said injection gate for liquid crystal material would have been obvious given the structure of rejected claims 2 and 3 above.

Response to Arguments

5. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

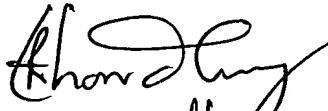
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-34925-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

Timothy L Rude
Examiner
Art Unit 2871

TLR
August 11, 2003


T. Chowdhury
Primary Examiner